REMARKS

The Office Action dated February 6, 2009, has been received and carefully noted. The above amendment to the claims, and the following remarks, are submitted as a full and complete response thereto.

Status of the Claims

Claim 15 has been amended to more particularly point out and distinctly claim the subject matter of the invention. No new matter has been added. Claims 1-15 are currently pending in the application and are respectfully submitted for consideration.

Rejection under 35 U.S.C. § 102

Claims 1, 5, 8, 12 and 15 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Haikawa (U.S. Patent No. 5,378,969). The Office Action took the position on pages 3-5 that Haikawa discloses all of the features of the rejected claims. Applicants respectfully traverse the rejection. Reconsideration of the claims is respectfully requested.

Independent claim 1, from which claims 2-7 depend, recites a system for recognizing a shape of a staircase or other polyhedron based on an image input from photographic means, including at least one camera as the photographic means and region selection means for selecting a predetermined region to be processed further for detailed analysis within the image photographed by the at least one camera. The system also includes processing region setting means for obtaining a range image from the image obtained by the at least one camera and for setting a processing region upon the obtained

range image based on the selected region and polyhedron shape recognition means for recognizing the shape of one or more polyhedrons based on the range image within a set candidate range.

Independent claim 8, from which claims 9-14 depend, recites a method of recognizing a shape of a staircase or other polyhedron based on an image input from at least one camera, including selecting a predetermined region within the image photographed by the at least one camera, obtaining a range image from the image obtained by the at least one camera and setting a processing region upon the obtained range image based on the selected region. The method also includes recognizing the shape of one or more polyhedrons based on the range image within a set candidate range.

Independent claim 15 recites a computer program embodied on a computer-readable storage medium for recognizing shape of a staircase or other polyhedron based on an image input from at least one camera. The program is configured to control a processor to perform a process, including selecting a predetermined region within the image photographed by the at least one camera, obtaining a range image from the image obtained by the at least one camera and setting a processing region upon the obtained range image based on the selected region. The method also includes recognizing the shape of one or more polyhedrons based on the range image within a set candidate range.

As will be discussed below, Haikawa fails to disclose or suggest all of the features of the presently pending claims.

Haikawa generally discusses "a system which enhances visual recognition processing speed and accuracy in a mobile robot which recognizes distinctive or characteristic shapes in its navigation environment which are suitable for a visual recognition algorithm and recognizes its own current position from the position of the recognized shapes" (column 1, lines 9-15). The system discussed in Haikawa may include "first means for predesignating shape features of an object existing in the environment, second means for establishing an evaluation function defined at least with respect to a distance between the object and the mobile robot and an angle determined at least by a pair of shape features, and third means for selecting a pair of shape features among the shape features in accordance with the evaluation function to recognize a current position at which the mobile robot exists in the environment" (column 1, line 62, through column 2, line 3, of Haikawa).

Independent claim 1 recites, in part, "region selection means for selecting a predetermined region to be processed further for detailed analysis within the image photographed by the at least one camera". Independent claims 8 and 15, which have their own scope, recite similar features. In the previous Response filed November 25, 2008, Applicants argued that while Haikawa discusses "calculating the visual field of the camera (vision sensor 32) at the estimated current position", after which "shape feature points are screened" (see column 5, lines 47-53), it appears that this is performed to find shape feature points for a "whole object", and as such, Haikawa does not disclose that a predetermined region of the visual field of the camera is selected, as claimed. The Office

Action stated on page 2 that "[w]hen Haikawa discloses screening the shapes in an image to determine the candidate shape points, this is interpreted as a predetermined region. The region to be evaluated is determined from the screening of the image scene." However, this is not how Haikawa operates.

Per the above, Haikawa discusses calculating the visual field of a camera and screening for shape feature points, not screening shapes in an image to determine candidate shape points, as the Office Action claims. As Applicants argued previously, Haikawa does not select a **predetermined region** for further processing. Rather, Haikawa appears to be concerned with listing "as many feature point candidates as are required for the ensuing processing for selection of the optimum shape feature points" (column 6, lines 1-3). This is apparently performed so a robot can recognize its own position from recognized shapes and assists the robot in planning a path in a map (see column 1, lines 7-15, of Haikawa). Haikawa determines the robot's distance from the feature points and subsequently determines the robot's current position in a map. As such, no "region" (of anything) is predetermined (*i.e.* determined in advance), as claimed. Further, while the Office Action may have interpreted the entire image of Haikawa as a "region" based on the wording therein, this is unreasonable as a region is commonly understood to be a part of a larger whole. Thus, interpreting a region to be the whole image is erroneous.

Independent claim 1 also recites, in part, "processing region setting means for obtaining a range image from the image obtained by the at least one camera and for

setting a processing region upon the obtained range image based on the selected region".

Independent claims 8 and 15, which have their own scope, recite similar features. On page 2, the Office Action asserted that "Haikawa discloses explicitly determining 'the distance between the robot and each shape feature point.' The distance between the feature points of the predetermined region and the robot is range directly determined by the image data." While the Office Action is correct that <u>Haikawa</u> discusses calculating the distance between the robot and each shape feature point (see column 6, lines 15 and 16), this is not equivalent to obtaining a **range image**, as claimed. The present specification discusses that in some embodiments, a range image may be, for example, a "3D image; specifically table data that indicates range information" (see page 11, lines 16 and 17). Nothing is cited or found in <u>Haikawa</u> that discusses a range image comprising a 3D image or table data.

Independent claim 1 further recites "polyhedron shape recognition means for recognizing the shape of one or more polyhedrons based on the range image within a set candidate range." Independent claims 8 and 15, which each have their own scope, recite similar features. The Office Action asserted on pages 2 and 4 that "Haikawa explicitly discloses that the polyhedron shapes or staircases are determined along with the range or distance to them (column 6, lines 9-23). This reads on recognizing polyhedrons in the candidate range. The range is interpreted to be a candidate range as it is determined from candidate points defining the object of interest or predetermined region." However, Applicants submit that this argument is incorrect.

First, Haikawa does not appear to disclose or suggest that polyhedron shapes or staircases themselves are recognized in column 6, lines 9-23. Rather, shape feature points and the distances thereof from the robot are determined. These shape feature points appear to only be candidates for portions of shapes on a map and as such, are not shapes themselves. Second, nowhere does Haikawa discuss a set candidate range, as claimed. Rather than setting a candidate range for identifying, for instance, a potential staircase, Haikawa appears to determine feature points for an entire image. As such, no candidate range for polyhedron identification, associated with a predetermined region, is present in Haikawa.

Claims 5 and 12 depend from independent claims 1 or 8 and add further features thereto. Thus, the arguments above with respect to the independent claims also apply to the dependent claims.

Per the above, Haikawa fails to disclose or suggest all of the features of the above-rejected claims under 35 U.S.C. § 102(b). Accordingly, it is respectfully submitted that the rejection is overcome and respectfully requested that the rejection be withdrawn.

Rejection under 35 U.S.C. § 103

Claims 2-4, 6, 7, 9-11, 13 and 14 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Haikawa in view of Tatsuto (JP 3,192,736). Applicants note that Tatsuto was submitted in the IDS filed in the present case on March 22, 2004. Claims 2-4, 6, 7, 9-11, 13 and 14 depend from independent claims 1 or 8 and add further features thereto. Nothing is cited or found in Tatsuto, which generally

discusses "what recognizes the object which projects from road surfaces, such as stairs" (paragraph [0001]), that overcomes the deficiencies of <u>Haikawa</u> discussed above with respect to the independent claims. Thus, the arguments above with respect to the independent claims also apply to claims 2-4, 6, 7, 9-11, 13 and 14.

Accordingly, it is respectfully submitted that the rejection is overcome and respectfully requested that the rejection be withdrawn.

Conclusion

For at least the reasons presented above, it is respectfully submitted that claims 1-15, comprising all of the currently pending claims, patentably distinguish over the cited art. Accordingly, it is respectfully requested that the claims be allowed and the application be passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, Applicants' undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

Michael A. Leonard II
_____
Michael A. Leonard II
Attorney for Applicants
Registration No. 60,180

Customer No. 32294
SQUIRE, SANDERS & DEMPSEY LLP
14TH Floor
8000 Towers Crescent Drive
Vienna, Virginia 22182-6212
Telephone: 703-720-7800
Fax: 703-720-7802

MAL:jf